To whom it may concern,

I am writing today to urge the FCC to reconsider its plans to roll back the reclassification of broadband providers under the *Title II Order*. These consumer protections are necessary to shield American consumers from the natural monopolies/oligopolies that provide broadband service, as well as to protect free speech and the First Amendment from large-scale, targeted censorship by private corporations in the twenty-first century. I am not a paid spokesperson, nor am I mindlessly reiterating another's talking points or copying a form letter. I am, however, a concerned and educated citizen who feels strongly enough about this issue to research it and share my informed opinion with the Commission.

The internet has changed dramatically in the 21 years since the *Telecommunications Act of 1996* was passed. What was at the time a luxury novelty has become an essential component of modern life. For many–including myself–the internet is the first recourse for nearly all facets of life, including but not limited to: paying bills, shopping, looking for a job, reading the news, communicating with others, entertainment, sharing political opinions, or even researching the mysteries of the universe (whether for work or pleasure). When Representative F. James Sensenbrenner Jr. insists that "Nobody's got to use the Internet,"[1] he expresses a profound misunderstanding of the lifestyle of the majority of Americans, particularly those of my generation that grew up alongside the internet. This statement is as absurd as if he had insisted 'Nobody's got to have electricity' or 'Nobody's got to travel by airplane.' While technically true, our lifestyles and our jobs require that we have electricity, and for many air travel is a necessity to travel for work or to visit friends and family spread through the American diaspora. Similarly, the internet has become an essential component of modern life. Ironically, I could not have researched or submitted this letter about the internet without the internet.

As a scientist, internet access is <u>essential</u> for my job. Compared to previous generations, internet access has revolutionized the exchange of timely information and drastically accelerated the pace of scientific discovery. Rather than waiting months for an article that has passed through peer review and been accepted for publication to make it into a print journal, which then must be delivered to a library and photocopied in person, I can access new research days after it has been published online. I also have easy, searchable access to nearly all of the recent history of research, to better facilitate effective experiments and lines of research in my own work. However, if the FCC choses to revoke the *Title II Order* and disband net neutrality protections, this free access to accurate information that I rely on for my work could be in jeopardy.

## Historical regulation of communication in America

Historically, the United States has recognized the importance of free and open communication for a functioning democracy. The Constitution laid the framework for a national postal service[2] in a time and place where there was much distrust of centralized government institutions, because timely communication was deemed important enough to merit government direction. The first test of the telegraph was funded by a direct grant from Congress.[3] While entrepreneurs initially

[1] Phillips, Kristine. "'Nobody's Got to Use the Internet': A GOP Lawmaker's Response to Concerns about Web Privacy." *The Washington Post*. N.p., 15 Apr. 2017. Web. 4 May 2017.
[2] US Constitution. Article I, Section 8, Clause 7.
[3] History.com Staff. "Morse Code & the Telegraph." *History.com*. N.p. 2009. Web. 7 May 2017.

invested heavily in this new communications technology, the industry underwent rapid consolidation, first as a series of regional monopolies and eventually a nationwide monopoly on telegraph communications by Western Union by 1866.[4] Though this monopoly was not unusual for the era of the Robber Barons, the invention of telephone had begun to replace the telegraph by the time Standard Oil was broken up under the Sherman Antitrust Act in 1911. AT&T, which briefly held control of Western Union, was forced to give it up under the threat of antitrust action and issue the "Kingsbury Commitment" in 1913 to temporarily forestall antitrust action against itself.

Clearly, this did not last. The voluntary commitments made by AT&T were insufficiently stringent to ensure appropriate competition despite the Attorney General's belief that the proposal would "be carried out in good faith."[5] Limitations on AT&T's commitments to permit interconnection and the continued approval of acquisitions through territory-swapping agreements–which eliminated competition at the individual level by creating 2 regions devoid of competition–resulted in little abatement of AT&T's march towards monopoly.[6] This state of affairs was eventually codified by the Willis-Graham Act, which formally identified telephone service as a natural monopoly; within 3 years AT&T had acquired 223 of 234 independent telephone companies.[7]

In 1934, President Franklin D. Roosevelt recognized that "the relationship of the Federal Government to certain services known as utilities should be divided into three fields: Transportation, power, and communications."[8] Thus, the Communications Act of 1934 was enacted to establish the FCC to "regulate…communication by wire and radio so as to make available…to all people to the people of the United States…a rapid, efficient, Nation-wide and world-wide wire and radio communication service with adequate facilities at reasonable charges"[9] [emphasis mine]. The FCC was thereby empowered to enforce the regulatory framework laid out in Title II of the act to protect American citizens from the monopoly powers of AT&T.

Yet even the regulations provided under Title II were not enough. Whether due to lax FCC oversight at the time, the lack of a single agency with the authority and expertise to oversee both financial and telecommunications activities of the gigantic monopoly, or simply the challenge of determining 'fair' rates in a market that had been devoid of competition for half a century, AT&T began to employ illegal cost-shifting procedures.[10] AT&T illegally subsidized its local calling business through its ownership of Western Electric, which itself held a monopoly on telecommunications equipment, and by overcharging for long-distance calling while blocking entry of competitors such as MCI to this more lucrative market. The Justice Department brought an antitrust suit against AT&T in 1974, eventually culminating a decade later in the dissolution of

[4] Nonnenmacher, Tomas. "History of the U.S. Telegraph Industry". EH.Net Encyclopedia, edited by Robert Whaples. August 14, 2001. URL http://eh.net/encyclopedia/history-of-the-u-s-telegraph-industry/ Web. 7 May 2017.
[5] Fung, Brian. "This 100-year-old deal birthed the modern phone system. And it's all about to end." *The Washington Post*. N.p.,19 December 2013. Web. 8 May 2017.
[6] Mueller, Milton, "Universal Service: Competition, Interconnection and Monopoly in the Making of the American Telephone System" (2013). *Books*. 18.
[7] Lloyd, Mark. "AT&T and Whatever Happened to Antitrust?" *AmericanProgress.org*. 5 April 2006. Web. 8 May 2017.
[8] "Communications Act of 1934." *Cybertelecom*. Web. 17 May 2017. http://www.cybertelecom.org/notes/communications_act.htm
[9] Communications Act of 1934. Pub. L. 73-416. 48 Stat. 1064. 19 June 1934.
[10] Barger, Melvin D. "AT&T Divestiture – What Killed Ma Bell?" *Beatriceco.com*. April 1984. Web. 17 May 2017. http://www.beatriceco.com/bti/porticus/bell/whatkilledmabell.html

AT&T's local calling services into 7 independent Regional Bell Operating Companies, while the parent company retained its long-distance network.[11]

This solution was far from perfect. As seen in the era of the Kingsbury Commitment, regional monopolies such as those granted to the Baby Bells still possess monopoly power within their territory. Further, the limited long-distance competition of AT&T with upstarts MCI and Sprint did not represent a particularly robust competitive milieu.[12] Some have argued that the price decreases in telephone service that came about in the wake of AT&T's divestiture were more likely a result of new FCC rate rules and competition from cellular and internet services.[13] Given the lack of real competition created by the AT&T breakup, this narrative seems entirely plausible.

## Telecommunications regulation and competition in the internet era

Though the commission should be well aware of this history, I bring it up to highlight the fact that telecommunications in the US has gone through repeated cycles of invention, expansion, consolidation, followed by government regulation and/or antitrust action. So too it is with the internet, with the caveat that internet access was initially provided by pre-existing infrastructure: dial-up and then DSL through phone lines and cable internet through the cable TV lines. In particular, the fact that dial-up internet used the existing and well-regulated telephone infrastructure allowed non-telecommunications companies (such as AOL) to become major internet providers despite not owning the wires their business depended on.[14]

The framework that enabled this open and competitive market was laid by the Telecommunications Act of 1996, which introduced the concept of unbundled network elements (UNEs). These aim to facilitate competition and override the natural monopoly barriers of wireline infrastructure by requiring incumbent carriers to provide access to their infrastructure at a cost-based price.[15] Though originally designed to create competition in telephone services, these line-sharing rules also initially created a competitive environment for DSL internet when they were expanded to cover this new telecommunications technology.[16]

In the decade following the Telecommunications Act of 1996, a concerted campaign of anticompetitive business practices and regulatory capture enacted by the Baby Bells and the cable industry resulted in the systematic destruction of these competition-promoting regulations, culminating in the revocation of all line-sharing obligations for ISPs in 2004 by the FCC.[17] For dial-up and DSL internet, UNE and Title II regulation had been specifically applied to the copper wire infrastructure, while the actual internet access providers were regulated more lightly under Title I

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[11] Pollack, Andrew. "Bell system breakup opens era of great expectations and great concern." *The New York Times*. 1 January 1984. Web. 17 May 2017.
[12] "History of the Bells." *Teletruth.org*. Web. 17 May 2017. http://www.teletruth.org/History/history.html
[13] Crandall, Robert W. "The AT&T divestiture: Was it necessary? Was it a success?" *U.S. Department of Justice*. Presentation. 28 March 2007. Web. 17 May 2017. https://www.justice.gov/atr/att-divestiture-was-it-necessary-was-it-success
[14] Pegoraro, Rob. "The Trump administration gets the history of Internet regulations all wrong." *The Washington Post*. N.p. 12 May 2017. Web. 17 May 2017.
[15] "Unbundled Network Element (UNE)". *Techopedia.com*. Web. 17 May 2017. https://www.techopedia.com/definition/26165/unbundled-network-element-une
[16] Goodman, Peter S. "FCC Adopts Line-Sharing Rules." *The Washington Post*. 18 November 1999. Web. 17 May 2017.
[17] Kushnick, Bruce. "How the Baby Bells and the government destroyed competition for DSL, long distance and local phone service. *Nieman Watchdog*. 13 April 2006. Web. 17 May 2017. http://www.niemanwatchdog.org/index.cfm?askthisid=196&fuseaction=ask_this.view

as an 'information service.'[18] In contrast, the FCC chose in 2002 to classify the entirety of cable internet service as an information service, including the both infrastructure and transmission service.[19] This deregulation was soon extended to all types of internet providers, resulting in the rapid demise of service-based ISPs and leaving line owners as the only providers of internet service.[17]

This brings us to the current state of broadband internet in the US. As of June 30, 2015 (the most recent summary I could find), 5 companies controlled over 80% of the broadband internet market (≥ 25 Mbps downstream, ≥ 3 Mbps upstream, per FCC definition), with nearly half of those being Comcast subscribers.[20] Those numbers do not reflect the recent acquisition of TWC by Charter, which would have further reduced nationwide competition to essentially 4 companies.

Furthermore, these companies have sorted themselves into a series of regional monopolies that avoid overlapping service areas,[21] as with telephone service in the early 20th century and following AT&T's divestiture in 1984. In June of 2016, 21% of populated census blocks lacked access to broadband internet, while 37% had only a single provider available.[22] It initially appears somewhat encouraging that 13% of districts have at least 3 providers, compared to 3% the previous year.[23] For my area in downtown Los Angeles, the FCC lists 5 internet providers, with 2 offering speeds meeting the definition for broadband (**Fig. 1**). Yet 3 of the 5 are satellite internet providers, including 1 of the 2 broadband providers. Viasat, the satellite ISP advertising broadband speeds, offers a mere 50 GB/month data cap, after which speeds could be slowed to less than 1 Mbps.[24,25] This essentially leaves me with only a single choice for broadband internet, in contrast to the numbers that the aggregate data would suggest for my area.

I thus began to suspect that the nationwide availability numbers listed above were being artificially inflated by the inclusion of technologies that do not provide customers with an equivalent experience, and that

Providers

| Name | Tech | Down | Up |
|---|---|---|---|
| AT&T California | ADSL | 6 | 1 |
| HughesNet | Satellite | 15 | 2 |
| Skycasters | Satellite | 2 | 1.3 |
| Time Warner Cable Inc | Cable | 300 | 20 |
| ViaSat Inc | Satellite | 25 | 3 |

**Figure 1. Internet providers in downtown Los Angeles.** *Source: FCC Fixed Broadband Deployment Map (https://www.fcc.gov/maps/fixed-broadband-deployment-data/).*

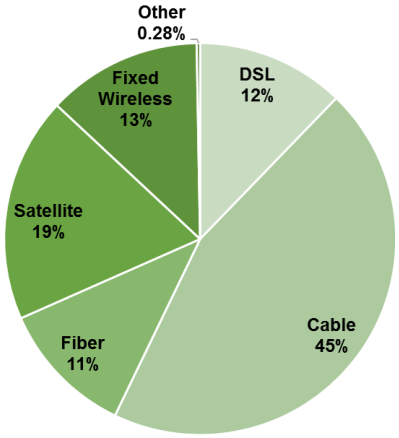


**Figure 2. Broadband availability by delivery technology.** Technology codes were used to assess the method used to offer broadband service, defined as ≥25 Mbps downstream and ≥3 Mbps upstream, per FCC definition. *Source: FCC Fixed Broadband Deployment Data: June, 2016.*

[18] Grabowski, Mark and Guniganti, Pallavi. "Take U.S. internet regulations back to the future." *Stanford Law and Policy Review Online*. 24 February 2015. Web. 18 May 2017.
[19] Marcia Clemmitt, *Controlling the Internet*, 16 Cong. Q. Res., 409, 422-23 (2006).
[20] "Free Press Petition to Deny Charter-Time Warner Cable Merger." *Freepress.net*. 13 October 2015. Web. 22 May 2017. https://www.freepress.net/sites/default/files/resources/Free_Press_15-149_Petition_to_Deny_10-13-15.pdf
[21] Holmes, Allen and Zubak-Skees, Chris. "U.S. Internet users pay more and have fewer choices than Europeans." *The Center for Public Integrity*. 1 April 2015. Web. 22 May 2017. https://www.publicintegrity.org/2015/03/27/16998/what-separates-us-and-european-internet-less-competition-more-costs
[22] "Internet Access Service Report." FCC Wireline Competition Bureau. April 2017. Web. 22 May 2017.
[23] "Internet Access Service Report." FCC Wireline Competition Bureau. August 2016. Web. 23 May 2017.
[24] http://www.exede.com/plan-results/liberty12/
[25] http://www.exede.com/liberty/

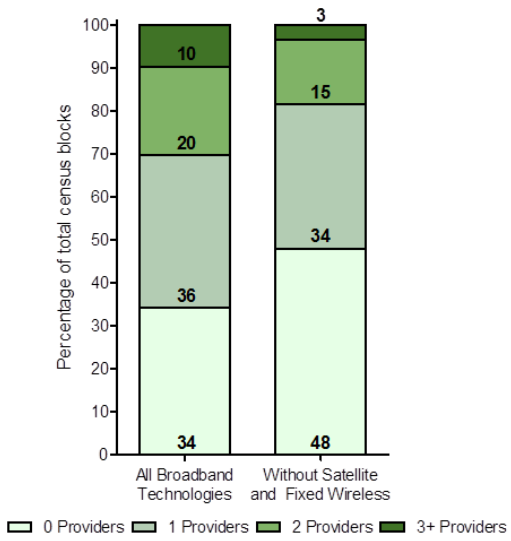


**Figure 3. Role of satellite and fixed wireless internet in broadband availability.** Total unique census blocks were grouped by number of providers, either for all technologies (left) or excluding satellite (code 60) and fixed wireless (code 70) providers, and percentages were calculated and plotted. *Source: FCC Fixed Broadband Deployment Data: June, 2016.*

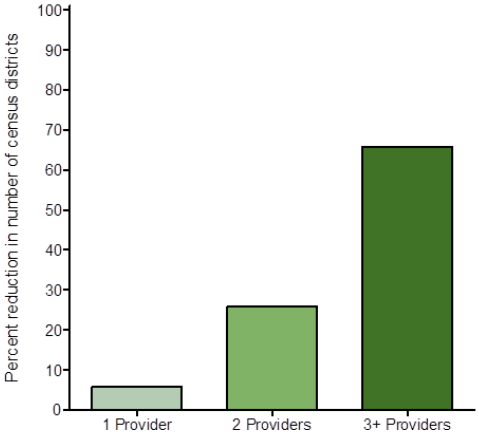


**Figure 4. Percent reduction in broadband availability when excluding satellite and fixed wireless providers.** The number of districts with each number of providers (excluding non-wired technologies) was subtracted from the total number of districts with each number of providers, and this was divided by the total number of districts with each number of providers to calculate the percent reduction. *Source: FCC Fixed Broadband Deployment Data: June, 2016.*

this spike in districts with at least 3 providers could be related to new availability of these providers in urban areas that already had 1 or 2 wireline providers. Isolating all of the available entries that advertised providing broadband service, 19% of these were offered by a satellite internet provider, with another 13% delivered via fixed wireless (**Fig. 2**). These data suggest that almost a third of broadband availability measured by the FCC is delivered by these nonequivalent technologies.

I then attempted to assess the impact of satellite and wireless providers on broadband availability on a per-district basis. My results including all technologies were slightly different than those reported by the FCC, likely because I was unable to exclude unpopulated districts from my analyses (**Fig. 3**). Nevertheless, this serves as an effective baseline to compare the frequency of provider availability when satellite and fixed wireless providers are excluded from the analysis. Among all census districts, only 3% had at least 3 providers when only considering wireline, compared with 10% with all delivery technologies. Only 18% of districts had more than a single choice for wired broadband internet, with nearly half having no options at all. Of the ~1.1 million districts with 3+ providers, only ~375,000 still met that criteria when excluding non-wired technologies (**Table 1**). This 66% reduction is in contrast to districts with 1 provider, which decreased by ~220,000 or 6% (**Fig. 4**). Together, these data demonstrate that satellite and fixed wireless technologies have an outsize influence on the FCC's broadband availability data, despite not offering comparable internet access to traditional wired technologies.

| | Number of blocks |
|---|---|
| Total unique census blocks | 11,078,970 |
| No broadband availability | 3,787,365 |
| With broadband availability | 7,291,605 |
| 1 Provider | 3,940,442 |
| 2 Providers | 2,255,114 |
| 3+ Providers | 1,096,049 |
| Total unique census blocks, excluding satellite and fixed wireless providers | 7,825,969 |
| No broadband availability | 2,055,652 |
| With broadband availability | 5,770,317 |
| 1 Provider | 3,720,474 |
| 2 Providers | 1,673,626 |
| 3+ Providers | 375,217 |

**Table 1. Census blocks with broadband availability, including or excluding satellite and fixed wireless service.** *Source: FCC Fixed Broadband Deployment Data: June, 2016.*

In summary, the deregulation of the infrastructure backbone of the internet to an information service under Title I led to a significant contraction of the broadband market. This is true at the national level, with a few conglomerates dominating the market, as well as locally, where most Americans lack the ability to choose from even 2 different broadband ISPs. This creates

an extreme concentration of market power where ISPs have the potential to leverage their near-exclusive transit rights to the detriment of both consumers as well as the companies they are using the internet to connect with.

## Abuses of monopolistic power and the necessity for Title II regulation of the internet

In the preceding years, we have seen multiple instances of anticompetitive activities by ISPs that served as the catalyst for the *Title II Order*.[26] Many net neutrality advocates remember the interconnection dispute between Netflix and several ISPs, where Comcast throttled the connections between Netflix and its customers to extort additional connection fees out of the streaming video provider.[27] Absent these fees, Comcast has no incentive to allow Netflix access to its subscribers, since the vast majority of them lack a competitor that they could switch to. In fact, as a pay TV provider, Comcast is specifically disincentivized to allow Netflix to compete with this other arm of its business by providing 'cord-cutters' with a substitute for a cable TV subscription. While Netflix at this point can afford to pay ISPs an access toll–despite the fact that consumers are already paying their provider for the data they are requesting from the company–new market entrants may not be able to do so. This double dipping market structure allows ISPs to act as content gatekeepers, with economic incentives to support incumbents at the expense of new entrants and thus stifle innovation; it is a clear example of the monopoly power of ISPs and the need for the FCC to outlaw these deals or at least oversee their fairness.

The ability of ISPs to choose winners and losers in the internet is not limited to relegating various competitors to so-called 'fast-lanes' or 'slow-lanes' depending on their contribution to the ISPs bottom line. Other abuses of monopolistic power that we have seen from the consumer side in the US have included: blocking traffic using peer-to-peer technologies, blocking of competing VOIP services by ISPs that are also phone providers, blocking all video providers outside of a selected partner, preventing mobile users from downloading tethering apps to bypass their own service in violation of a voluntary pledge, or even hijacking and redirecting user search queries for profit.[26] In Canada, an ISP went so far as to block a website supporting a strike against itself in 2005. These violations prove that, beyond the potential for speeding or slowing competitors, we should be particularly concerned with the ability of ISPs to outright block internet connections to sources who are unable/unwilling to pay a ransom or who disagree with the ISPs actions or politics; this last point is particularly concerning from a First Amendment standpoint.

Recently, Chairman Pai[28] and ISPs such as AT&T[29] have suggested that ISPs are in fact in support of net neutrality and that voluntary commitments will be sufficient to support this framework. This is disingenuous from both sides. ISPs have repeatedly sued to prevent the FCC from instituting net neutrality regulations. In 2010, Comcast won a judgement ruling that the FCC could not censure them for their aforementioned blocking of peer-to-peer traffic.[30] When the FCC

[26] Karr, Timothy. "Net Neutrality Violations: A Brief History." *Freepress.net*. 25 April 2017. Web. 18 May 2017. https://www.freepress.net/blog/2017/04/25/net-neutrality-violations-brief-history
[27] Ramachandran, Shalini. "Netflix to Pay Comcast for Smoother Streaming." *The Wall Street Journal*. 23 February 2014.
[28] Brodkin, Jon. "FCC chair wants to replace net neutrality with "voluntary" commitments." *Ars Technica*. 7 April 2017. Web. 12 July 2017.
[29] Quinn, Bob. "Why We're Joining the 'Day of Action' in Support of an Open Internet." *AT&T press release*. 11 July 2017. Web. 12 July 2017. https://www.attpublicpolicy.com/consumer-broadband/why-were-joining-the-day-of-action-in-support-of-an-open-internet/
[30] Wyatt, Edward. "U.S. Court Curbs F.C.C. Authority on Web Traffic." *The New York Times*. 6 April 2010. Web. 12 July 2017.

attempted to establish formal legal guidelines ensuring net neutrality within the framework of Title I, Verizon sued and successfully overturned the 2010 Open Internet Order, with the court concluding, "Given that the Commission has chosen to classify broadband providers in a manner that exempts them from treatment as common carriers, the Communications Act expressly prohibits the Commission from nonetheless regulating them as such."[31] Thus, AT&T's assertion that, with Title II reclassification, the FCC had "abandoned this carefully crafted framework and instead decided to subject broadband service to an 80-year-old law designed to set rates in the rotary-dial-telephone era"[29] ignores the fact that the courts have ruled that classifying ISPs as common carriers is the only way to regulate them as such.

Chairman Pai's idea that voluntary commitments by ISPs to commit to open internet principals in their terms of service will be sufficient to maintain net neutrality is both naïve and inconsistent with views that he has previously expressed. Something as capriciously mutable as terms of service, which companies can rewrite at will, cannot be trusted to maintain important principals, particularly when these can deleteriously impact a company's profits. In fact, Chairman Pai himself acknowledged the folly of voluntary commitments in a speech in 2013 when he was an FCC commissioner:

> "In reality, however, the Kingsbury Commitment was a wolf in sheep's clothing. It was a triumph for AT&T because it paved the way for the company's monopolization of the telephone industry. Essentially, the company obtained government approval of AT&T's strategy of consolidation and regulation and shielded itself from real competition."[32]

He then went on to cite many of the same flaws that I have previously enumerated with this bargain, including its toothlessness, its ability to be bypassed by territory-swapping agreements, and the shortcomings of AT&T's interconnection commitments. To turn away from this opposition to voluntary commitments now that he is the commissioner of the FCC represents a bizarre and sudden change in viewpoint that needs to be explained to the American people.

The chairman's other proposal is that the FTC rather than the FCC should be responsible for ensuring fair business practices from ISPs.[33] However, the laws, authority, and expertise of the FTC are insufficient to regulate a resource as complex, important, and encompassing as internet access. In particular, unlike the FCC, the FTC lacks rulemaking authority.[34] Its activities are punitive and largely occur after the fact; looking forward, it relies on bargains and voluntary agreements, which represent exactly the sort of coordination between corporations and the government that Chairman Pai characterized as regulatory capture and railed against in his 2013 speech. Other complex fields with significant power are regulated by dedicated agencies, including food safety and therapeutic drugs by the FDA, electrical infrastructure by the DOE, and transportation by the DOT. Of note, 2 of these examples are among the 3 major utilities identified by President F.D. Roosevelt in 1934, the third of which is communications, regulated by the FCC.

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[31] Brodkin, Jon. "Net neutrality is half-dead: Court strikes down FCC's anti-blocking rules." *Ars Technica.* 14 January 2014. Web. 12 July 2017.
[32] Pai, Ajit. "Remarks of FCC Commissioner Ajit Pait at Techfreedom's Forum on the 100th Anniversary of the Kingsbury Commitment." Washington, DC. 19 December 2013. Web. 12 July 2017. https://apps.fcc.gov/edocs_public/attachmatch/DOC-324810A1.pdf
[33] Brodkin, Jon. "Ajit Pai announces plan to eliminate Title II net neutrality rules." *Ars Technica*. 26 April 2017. Web. 17 May 2017.
[34] Brodkin, Jon. "Trump voters need fast broadband and net neutrality too, Tom Wheeler says." *Ars Technica*. 20 January 2017. Web. 12 July 2017.

Most troublingly, recent court rulings have asserted that the FTC lacks the authority to regulate common carriers, even for the portions of their business not subject to common carrier laws.[35] If the FCC cedes its authority in these matters, there may well be nothing left to protect Americans from these megacorporations.

The major argument put forward to repeal Title II regulations is that they have stifled competition and harmed investment in broadband infrastructure. In the preceding section I have largely addressed the former, demonstrating the lack of competition both nationally, with the market dominated by an oligopoly of a few providers, and locally, with most Americans lacking any choice in broadband providers. This monopolistic state of affairs is unlikely to change in the absence of Title II regulation. During its attempted purchase of Time Warner Cable in 2014 (prior to the issuance of the Title II Order), Comcast admitted: "Comcast and TWC have never had plans to expand into each other's territory and overbuild each other. Indeed, no incumbent cable operator ever has" [emphasis mine].[36] Rather than expanding infrastructure into new territory, ISPs find it more expeditious to expand their territory through acquisitions and mergers, much like AT&T in the early days of telephone service. This obviously has negative effects on both local and national competition. The only way for the government to attempt to encourage competition outside of bringing back UNEs or some other form of local loop unbundling to open lines to competitors–overbuilding requirements as a stipulation for mergers–was recently vacated by the current FCC regime for the merger between Charter and TWC.[37]

As for the assertion that Title II regulations have led to reduced investments in broadband infrastructure, this is an unacceptable overinterpretation of a single data point. Data from broadband lobbying groups which is self-reported by ISPs suggested a drop in broadband investment from $74 billion to $71 billion, a 4% decease.[38] Depending on how the data is calculated and what exactly is defined as "broadband infrastructure," some figures suggest broadband investment may have instead increased 5% in the two years following the institution of Title II regulations.[39] While no measures of variance or precision are provided, these changes do not seem to be particularly striking, especially when slightly different analyses yield positive or negative changes. As this represents only a single data point, more time under Title II regulation would be required to attempt to accurately assess its effects on broadband infrastructure investment. However, if Title II regulation is indeed the cause of the slight downturn in investments voluntarily reported by the broadband industry, then should there not also have been a sign of this in 2014 when these rules were initially under discussion and supposedly hanging over ISPs like the sword of Damocles? That there was instead an increase in that year suggests that this argument is merely a smokescreen by ISPs in their advocacy for regulatory rollback.

Indeed, in statements to investors whose veracity is mandated by SEC regulations, each of the major ISPs–Comcast, Charter, Verizon, and AT&T–have indicated that Title II regulations have

[35] Federal Trade Commission v. AT&T Mobility LLC. United States Court of Appeals for the Ninth Circuit. No. 15-16585. 29 August 2016. Web. 31 May 2017. https://cdn.ca9.uscourts.gov/datastore/opinions/2016/08/29/15-16585.pdf
[36] Brodkin, Jon. "Comcast says it's too expensive to compete against other cable companies." *Ars Technica.* 24 September 2014. Web. 8 May 2017.
[37] Kastrenakes, Jacob. "FCC removes competition requirement from Charter-TWC merger conditions." *The Verge*. 3 April 2017. Web. 12 July 2017.
[38] Brogan, Patrick. "Broadband Investment Heads in the Wrong Direction." *US Telecom*. 5 May 2017. Web. 12 July 2017. https://www.ustelecom.org/blog/broadband-investment-heads-wrong-direction
[39] Turner, S. Derek. "It's Working: How the Internet Access and Online Video Markets Are Thriving in the Title II Era." May 2017. Web. 12 July 2017. https://www.freepress.net/sites/default/files/resources/internet-access-and-online-video-markets-are-thriving-in-title-II-era.pdf

not impacted their investments in broadband or their projected business prospects in the coming years.[40] Moreover, AT&T's downturn in investments which is largely blamed for the reduction in 2016 was planned by the company back in 2012, representing a return to baseline after 3 years of increased spending.[41] Clearly one of these points of view regarding the role of Title II regulation in broadband investment is untrue. Which is more likely: that multiple ISPs have chosen to blatantly violate SEC regulations regarding accuracy of disclosures to investors, or that these companies are lying to and misleading the public with their claims that Title II regulation have damaged broadband investments?

Finally, I want to briefly address the claims that the broadband internet is an information service and that the FCC lacks the authority to reclassify it as a telecommunications service. The latter point has recently been settled by the US Court of Appeals, who denied the broadband industry's petition for an *en banc* hearing, letting stand the prior decision that supported the FCC's *Title II Order*.[42] As for the former, while the NPRM throws every possible idea at the wall in order to see what sticks, the gist of this argument appears to be predicated on the idea that internet access provides customers with the "capability" of performing a variety of complex functions that fall under the umbrella of information services and that ISPs provide a variety of tools to facilitate these interactions (e.g. DNS and email services) so that customers do not precisely know the "points of [their] choosing." While the internet has dramatically increased the throughput of these operations by eliminating the need for human intermediaries, each of these points seem directly analogous to functions provided by telephone service. DNS redirecting services are no different from a telephone switchboard; I have no more idea exactly where I'm being connected with when I call an 800 number and am connected with a call center in India than I do the physical location or the IP address of Google's servers. Email provided by the ISP (that most people don't even use) provides temporally disconnected communication just as a telephone provider's voicemail services do. Other network management techniques such as firewalls seem to obviously qualify as "use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service."[43] Access to more complex information or capability facilitated by internet access is not a part of the ISPs business and thus should not even be considered in the discussion of whether ISPs are common carriers, much like "providers that manage toll-free numbers 'do not need to be carriers'"[44] because they are one level abstracted from the basic telecommunications pipeline and customers would have alternative choices using the same telephone connection service. To me, internet access is assuredly a telecommunications service and the FCC should regulate it as such.

## The Orwellian potential of ISPs in the absence of Title II regulation

While we can argue endlessly about the minutiae of investment figures and which analysis is most accurate, a more important point to consider is how the revocation of Title II regulations might affect the future of communications in America. While improving internet access and availability

[40] Brodkin, Jon. "Title II hasn't hurt network investment, according to the ISPs themselves." *Ars Technica*. 16 May 2017. Web. 12 July 2017.
[41] "AT&T to Invest $14 Billion to Significantly Expand Wireless and Wireline Broadband Networks, Support Future IP Data Growth and New Services." *AT&T press release*. 07 November 2012. Web. 12 July 2017.
[42] Brodkin, Jon. "Too little, too late? FCC wins net neutrality court case." *Ars Technica*. 1 May 2017. Web. 15 July 2017.
[43] 47 U.S.C. § 153(24); Title II Order, 30 FCC Rcd at 5765–66, para. 366.
[44] 800 Data Base Access Tariffs and the 800 Service Management System Tariff; Provision of 800 Services, CC Docket Nos. 93-129, 86-10, Report and Order, 11 FCC Rcd 15227, 15248–49, paras. 44–45 (1996).

is clearly one of the FCC's main roles, we also must consider the quality of access being provided. With ongoing technological advancements and changes in communication norms, I would argue that the possible answers to this question are terrifying and much more perilous than they might have been a decade or even 5 years ago.

We have already seen that ISPs are willing and able to prevent access to or even alter the flow of information through their networks in self-interest or in the pursuit of profit. These clumsy interventions are merely the beginning. Even 5 years ago, the idea of successfully suppressing or manipulating information on the internet would have been laughable. It's just too big, and any attempt to do so was a hopeless game of whack-a-mole where one source gets eliminated and three more pop up shortly thereafter. This is evident in the difficulties that copyright holders have had in suppressing the replication of their works through the internet despite their best lobbying efforts. However, as computing power increases and we gain ever-increasing abilities to gather and interpret big data, particularly through machine learning, so too will we gain ever-increasing ability to manipulate it. We have already seen this somewhat in the way social networking algorithms have facilitated the formation of echo-chambers that bring together like-minded individuals and exclude dissenters. This is already problematic, but at least to some degree reflects voluntary actions on the parts of individuals. Yet what might happen when these tools are applied involuntarily to prevent access to and alter information to reflect the desired viewpoint of an ISP or one of their partners?

Facebook can only control the spread of information within its own network. ISPs, in contrast, have access to all the packets that pass through their network. Combined with modern computing power and machine-learning algorithms, it becomes feasible to block or alter information in an automated manner in ways that would have been previously unimaginable, particularly since the spread of information now largely takes place over the internet. ISPs could censure negative comments on their connection speeds or customer service quality from proliferating. A drug manufacturer could encourage ISPs to suppress the spread of data regarding rare side-effects that might affect their bottom line. Companies, organizations, and individuals who deny the existence of climate change may attempt to alter the accuracy of facts and viewpoints in order to shift discourse in their favor. Political parties might use these techniques to their advantage, whether by suppression of negative information against their own candidates, spreading misinformation about their opponents, or altering impressions of support for their policies. This could be done by either party, and both sorts of misinformation are detrimental to a democracy that depends on the free and open exchange of information. For those who would argue that encryption (https) could prevent these packet manipulations, if Title II is revoked, ISPs would be able to block any packets delivered using this protocol and the FCC would be no more able to prevent this than they were to punish Comcast for its blocking of Bittorrent protocols prior to the *Title II Order*.

As a scientist, the concept of a private corporation being able to control the flow of information and choose which viewpoints are allowed to be heard is anathema to the scientific method. Scientific consensus emerges when all of the data is made available, its credibility assessed by the community as a whole, and a conclusion supported by most of the best data is most likely to be true. When reliable dissenting data later emerges, the consensus is revised as we gain a better understanding of how the world works. Some science is already facing challenges with dependability and reproducibility of specifics due to carelessness and the occasional case of

outright malice. If we cannot trust that the information we are present with is unadulterated by special interests, the whole scientific process has the potential to break down, derailing the steady progress of society we have been in since the Renaissance and sending the world into another Dark Age.

While ISPs specifically targeting the free exchange of scientific information seems unlikely at this juncture (but certainly possible in the future), other categories of speech are much more susceptible to censure by the gatekeepers of the internet. Politics and the opinions of minorities or those otherwise disadvantaged in wealth or power are all susceptible to manipulation and censure. The internet enables propaganda in previously unfathomable ways, and giving the gatekeepers of this public space unfettered ability to control it cannot be to the benefit of the American people or the world as a whole.

One could argue that this is all fantastical doomsaying and that it could never come to pass. They might have a point. However, the government has an obligation to the people it serves to not just consider what has happened but what might happen in the future. If even a tenth of what I have suggested here comes true, I find that prospect much more terrifying than the potential that ISP profits might drop by a few percent.

## Conclusion

Telecommunications are an essential resource for a functioning democracy. As we have repeatedly observed historically, the infrastructure requirements make these services natural monopolies, so once a new communications medium becomes big enough, government regulation is necessary to ensure fairness in these essential technologies. Have these efforts been perfect? Of course not. Flaws have been repeatedly discovered and alternations been made in efforts to judiciously regulate telephone service, and the evolution of the internet has largely retreated the same regulatory paths. Now that the industry is approaching another peak of consolidation, government intervention is necessary to preserve fair pricing, access, and the open internet through net neutrality. For all its flaws, the courts have ruled that Title II regulation is the only way to achieve this, and employing it is better than the alternatives.

The American people are in favor of net neutrality. In a recent poll sponsored by the NCTA, 61% of respondents supported the principals of net neutrality in a bipartisan manner.[45] While this poll also purports to show opposition to Title II regulation, it does so by asking about regulation of the internet as a public utility (such as electricity), rather than by comparison to telephone service which is what Title II actually does. Other findings include support for light-touch and rarely involved regulations, when the alternatives given–"active involvement"–imply an active regulation and censure of the internet by the government.

Contrary to the caricature presented by opponents of net neutrality, I and others do not support government intervention in speech on the internet. For instance, I am opposed to laws passed in Europe regarding the right to be forgotten[46] or a recent law in Germany required removal of hate

[45] "Morning Consult NCTA Polling Recap." May 2017. Web. 15 July 2017. https://www.ncta.com/sites/prod/files/morning_consult_poll_toplines_1.pdf
[46] Bright, Peter. "Europe proposes a 'right to be forgotten.'" *Ars Technica*. 25 Jan 2012. Web. 15 July 2017.

speech within 24 hours.[47] I feel these do indeed place an undue burden on internet companies as well as violate the principals of free speech that America was founded on. However, I am similarly opposed to private interests having an undue influence on speech. As corporations are not obliged to obey the First Amendment, net neutrality supported by Title II regulations is the only way to enforce this requirement. Net neutrality ensures that neither government nor private interests can impede the spread and accuracy of information. Do we not owe it to the American people to ensure their communications remain free and unaltered by all parties?

Last year, in a resolution signed by 193 countries including the US, the UN declared open internet access a universal human right: "Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers"[48] [emphasis mine]. As has been repeatedly made clear in litigation, the FCC lacks the authority to ensure this without the framework of Title II. Nonbinding, voluntary commitments will not suffice to ensure that Americans maintain their right to open and unmanipulated access to this essential communications resource.

If Chairman Pai is indeed honest when he claims that the quality of comments is more important than their quantity,[49] then I hope the commission takes the thoroughness of my remarks here as a sign of their quality and gives them appropriate consideration rather than dismissing them out of hand because they disagree with their preconceived notions.

**Once again, I urge the commission to reconsider their proposal and preserve the classification of broadband internet as a telecommunication service and to continue to regulate ISPs under Title II.**

Sincerely,

Geoffrey L. Rogers, Ph.D.

[47] Mullin, Joe. "Germany passes law with huge fines for Internet companies that don't bar hate speech." *Ars Technica*. 30 June 2017. Web. 15 July 2017.
[48] Howell, Catherine and West, Darrell M. "The internet as a human right." *The Brookings Institute*. 7 November 2016. Web. 18 May 2017. https://www.brookings.edu/blog/techtank/2016/11/07/the-internet-as-a-human-right/
[49] Brodkin, Jon. "Ajit Pai not concerned about number of pro-net neutrality comments." *Ars Technica*. 14 July 2017. Web. 15 July 2017.